

CLAIMS

1. A capsule (1) for a powder (2) having a body which is provided with an internal chamber (21) to hold the powder and first and second openings (17, 15) to an exterior environment, the body adapted to be displaced from a filling state, in which the first and second openings are placed in fluid communication with one another through the internal chamber thereby enabling creation of an airflow through the body from the second opening (15) to the first opening which is able to entrain powder in the exterior environment into the internal chamber for filling thereof, to a sealing state in which the internal chamber is sealed from the exterior environment so as to retain the powder held therein.
2. The capsule of claim 1 in which the filling and sealing states are, respectively, expanded and contracted states of the body.
3. The capsule of claim 1 or 2 wherein in the filling state of the body the first opening is partially obstructed to an extent which permits airflow therethrough, but which becomes occluded with powder entrained in the airflow.
4. The capsule of claim 1, 2 or 3 in which the body is a multi-part structure in which parts (3, 5) of the body are moved relative to one another to bring the body to its filling and sealing states.
5. The capsule of claim 4 in which the body is assembled in both the filling and sealing states.
6. The capsule of claim 4 or 5 in which the body has first and second parts (5, 3) which are moved relative to one another to bring the body to its filling and sealing states.
7. The capsule of claims 5 and 6 wherein in the filling and sealing states the first part is mounted to the second part.

8. The capsule of claim 6 or 7 wherein in the sealing state the first part is disposed in a first position relative to the second part in which it sealingly closes the first and second openings, and wherein in the filling state the first part is
5 disposed in a second position relative to the second part in which it opens the first and second openings.

9. The capsule of any one of claims 6 to 8 when appended to claim 3 in which the first part partially obstructs the first opening in the filling state.
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10. The capsule of claim 9 in which the first part is partially plugged in the first opening in the filling state.

11. The capsule of claim 10 in which the first part has a plug section (34)
15 which is located in the first opening in the filling state, the plug section having an outer surface (37) which, in the filling state, is at least in part spaced from an inner surface of the first opening.

12. The capsule of claim 11 in which the outer surface has first and second
20 outer surface portions, wherein in the filling state the first outer surface portion (37) is spaced from the inner surface of the first opening and the second outer surface portion abuts the inner surface of the first opening.

13. The capsule of claim 12 in which the first outer surface portion
25 corresponds to one or more channels (37) in the outer surface of the plug section.

14. The capsule of claim 11, 12 or 13 in which the plug section is a first plug section and the first part has a second plug section which sealingly plugs the first
30 opening in the sealing state.

15. The capsule of claim 14 in which the body is moved from the filling state to the sealing state by movement of the first part in a first direction relative to the second part, the first plug section being disposed, in use, on the first part in the first direction relative to the second plug section.

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16. The capsule of claim 14 or 15 in which the first and second plug sections are contiguously arranged.

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17. The capsule of claim 8 or any one of claims 9 to 16 when appended to claim 8 in which the first part sealingly plugs the second opening in the sealing state.

18. The capsule of any one of claims 6 to 17 in which the first opening is formed in the second part.

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19. The capsule of any one of claims 6 to 18 in which the second opening is formed in the second part.

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20. The capsule of claims 18 and 19 in which the second part is a sleeve part with an internal passageway (21) which connects the first and second openings.

21. The capsule of claim 20 in which the first opening is formed by a restriction (25) in the passageway.

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22. The capsule of claim 21 in which the restriction is formed by an inwardly directed shoulder (25) in the passageway.

23. The capsule of any one of claims 20 to 22 in which the second opening is formed at an end of the internal passageway.

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24. The capsule of any one of claims 6 to 23 in which the first part is mounted in the second part for sliding movement relative thereto.

25. The capsule of any one of claims 6 to 24 in which the internal chamber is defined between the first and second parts.

5 26. The capsule of any one of claims 20 to 23 in which the first part is slidably mounted in the passageway and the internal chamber is defined between the inner surface of the passageway and the outer surface of the first part.

10 27. The capsule of any one of claims 6 to 26 wherein in the filling state the first part extends through the second opening to leave a gap therebetween for ingress of the entrained powder into the internal chamber and wherein in the sealing state the first part is moved into sealing relation in the second opening.

15 28. The capsule of claim 27 in which the first part has a cap section (39) which, in the filling state, is spaced exteriorly of the second opening, but which in the sealing state is sealingly seated in the second opening.

20 29. The capsule of claim 28 when appended to claim 11 in which the first part has a shank section (29) connecting the cap section to the plug section.

30. The capsule of any one of claims 6 to 29 in which the first and second parts are further movable relative to one another to bring the body from the sealing state to a discharging state in which an airflow is able to be produced through the body from the first opening to the second opening to entrain the powder in the internal chamber into the exterior environment.

30 31. The capsule of claim 30 when appended to claim 11 wherein the first part has a section with a transverse dimension which is less than the corresponding dimension of the plug section, the section being located with respect to the plug section such that in the discharging state it is brought into registration with the first opening.

32. The capsule of any one of the preceding claims comprising a pharmaceutical powder in the internal chamber.

33. The capsule of claim 32 having a unit dose of the pharmaceutical powder
5 in the internal chamber.

34. The capsule of any one of the preceding claims in which the internal chamber is the sole internal chamber.

10 35. An inhalation device comprising one or more capsules according to claim 33 or 34.

36. A method of providing a capsule filled with a powder having the steps of:-
(a) providing a capsule according to any one of the preceding claims in its filling
15 state,

(b) creating an airflow through the body of the capsule in a direction from the second opening to the first opening to cause powder from a powder source disposed externally of the capsule to be entrained into the internal chamber of the body, and

20 (c) moving the capsule to its sealing state.

37. The method of claim 36 in which the powder source is a powder cloud.

38. The method of claim 36 or 37 in which the airflow is created by applying a
25 vacuum at the first opening.

39. The method of claim 36, 37 or 38 in which the powder is a pharmaceutical powder.

30 40. The method of any one of claims 36 to 39 applied to a plurality of the capsules simultaneously.

41. The method of any one of claims 36 to 40 applied to a plurality of the capsules so that each capsule contains the same quantity of powder or substantially the same quantity of powder.

5 42. A capsule for a powder substantially as hereinbefore described with reference to, and as illustrated by, the accompanying FIGURES of drawings.

43. A method of filling a capsule with powder substantially as hereinbefore described with reference to, and as illustrated by, the accompanying FIGURES of
10 drawings.